

**ABSTRACT**

A method for making a membrane electrode assembly includes the steps of providing a membrane electrode assembly including an anode including a hydrogen oxidation catalyst; a cathode; a membrane disposed between the anode and the cathode; and depositing a peroxide decomposition catalyst in at least one position selected from the group consisting of the anode, the cathode, a layer between the anode and the membrane and a layer between the cathode and the membrane wherein the peroxide decomposition catalyst has selectivity when exposed to hydrogen peroxide toward reactions which form benign products from the hydrogen peroxide. The peroxide decomposition catalyst can also be positioned within the membrane. Also disclosed is a power-generating fuel cell system including such a membrane electrode assembly, and a process for operating such a fuel cell system.